

**WHAT IS CLAIMED IS:**

1        1. A power supply for driving opposing corona chargers  
2 comprising:

3              a pair of transformers on the power supply, each of the  
4          transformers providing an output;

5              a current sense element attached to each of the  
6          transformers;

7              a current regulation circuit that is responsive to each of  
8          the current sense circuits in accordance with a predetermined  
9          parameter to adjust current flowing through the transformers;

10             a voltage monitoring circuit for each of the transformers;  
11 and

12             a voltage control circuit that is responsive to the output  
13          voltage monitoring circuit to limit the transformer voltage to  
14          less than a predetermined value.

1        2. The power supply of claim 1 wherein the current  
2          regulation circuit is a DC-to-DC converter that responds to the current  
3          sense circuit by adjusting the transformer voltage.

1        3. The power supply of claim 1 wherein the current sense  
2          circuit is configured to sense voltage from the transformer secondary.

1        4. The power supply of claim 3 wherein the current sense  
2          circuit that is configured to sense voltage from the transformer  
3          secondary senses a voltage developed by the flow of current through  
4          an element in the series with the transformer secondary.

1        5. The power supply of claim 1 further comprising a clock  
2          generation circuit that provides synchronized clocks of opposite  
3          polarities to the transformer creating AC outputs to the transformers.

1        6. The power supply of claim 5 wherein each of the  
2 transformers have a pair of primary coils that are electrically  
3 connected to opposite phases of the clock generation circuit.

1        7. The power supply of claim 6 wherein both the  
2 transformers have the primary coils receiving opposite clocks phases  
3 such that the transformer secondary coils are synchronized to provide  
4 opposing AC outputs.

1        8. The power supply of claim 1 further comprising a current  
2 signal conditioning circuit connected to each of the current sense  
3 elements.

1        9. The power supply of claim 1 wherein the current  
2 regulation circuit is a DC-to-DC converter that can be programmed to  
3 regulate current through a range by adjusting the transformer voltage  
4 and also programmed responsive to the voltage monitoring circuit to  
5 limit the transformer voltage.

1        10. A power supply for driving a corona charger comprising:  
2              a pair of outputs to the power supply;  
3              at least one current sense element connected to the power  
4 supply;  
5              at least one voltage monitoring circuit connected to the  
6 power supply; and  
7              a DC-to-DC converter that is programmed to regulate  
8 current through a range of loads in response to the current sense  
9 element and also programmed as a voltage limiting device for  
10 the power supply.

1        11. The power supply of claim 10 further comprising a clock  
2 generation and inverter circuit connected to the power supply to  
3 provide synchronizing and opposing AC outputs.

1        12. The power supply of claim 11 wherein the current sense  
2 element is configured to sense voltage from the transformer  
3 secondary.

1        13. The power supply of claim 12 wherein the current sense  
2 element that is configured to sense voltage from the transformer  
3 secondary senses a voltage developed by the flow of current through  
4 an element in the series with the transformer secondary.

1        14. The power supply of claim 10 further comprising a  
2 current signal conditioning circuit connected to the current sense  
3 element.

1        15. A method for supplying power to a corona charger to  
2 regulate current without exceeding voltage limitations comprising the  
3 steps of:

4                providing a pair transformers driven at their input to have  
5 opposite phases of an AC signal;

6                connecting a programmable regulator to the transformers  
7 output to apply a DC voltage level at the transformers output;

8                sensing current being sourced through the transformers  
9 by circuitry operatively connected to the transformers inputs  
10 and the programmable regulator;

11               adjusting the DC voltage level provided by the  
12 programmable regulator at the transformer output in response to  
13 the sensing step;

14               sensing voltage applied to the transformer output; and

15                    responding via the programmable regulator to limit  
16                    voltage applied to the transformers output in excess of a  
17                    predetermined amount.

1                 16. The method of claim 15 wherein the step of connecting  
2 further comprises connecting a DC-to-DC converter as the  
3 programmable regulator, and the DC voltage level applied by the  
4 regulator is responsive to sensed current from the transformers to keep  
5 current flowing through the transformers constant.

1                 17. The method of claim 16 wherein the step of connecting  
2 further comprises responding to voltage sensed at the transformer  
3 output to limit the transformer output voltage to a predetermined  
4 amount.

1                 18. The method of claim 17 wherein the step of connecting  
2 further comprises the DC-to-DC converter being programmed to  
3 regulate current through a range by adjusting the transformer voltage.